REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. In the claims

As shown in the foregoing LIST OF CURRENT CLAIMS, the claims have been amended to more clearly point out the subject matter for which protection is sought.

In particular, claims 1-4, 7, 8, 10, 11, and 13 are amended, and claim 5 is canceled.

It is respectfully submitted that no new matter is added, since support for the amendments may be found, for example, at least in Figs. 5, 7, and 12 of the pending application and at least on page 10, lines 23-30, page 14, lines 10-25, page 25, lines 20-29, and page 26, line 9 through page 27, line 5 of the accompanying description in the specification as originally filed.

Claims 6, 9, and 12 are left unchanged.

Entry of the LIST OF CURRENT CLAIMS is respectfully requested in the next Office communication.

2. Rejection of claims 1-3 and 7-12 under 35 U.S.C. § 103(a) as unpatentable over U.S. publication no. 2004/0046024 (*Natsukari et al.*) in view of U.S. publication no. 2006/0098227 (*Namizuka et al.*)

Reconsideration of this rejection is respectfully requested, in view of the amendments to claims 1, 7, and 10, on the basis that the proposed combination of the *Natsukari* and *Namizuka* publications fails to establish a *prima facie* case of obviousness with respect to amended claims 1, 7, and 10. The remaining claims depend from either claim 1, 7, or 10, and are therefore patentable as containing all of the recited elements of claims 1, 7, or 10, as well as for their respective recited features.

By way of review, amended claims 1, 7, and 10 refer to a 2-dimensional code formation method and a 2-dimensional code formation device. In particular, amended claim 1 includes the step of specifying a fixed code size for a 2-dimensional code regardless of an amount of storage information to be written in the 2-dimensional code, the step of specifying storage information to be written in the 2-dimensional code, the step of calculating cell size for a unit cell of the 2-dimensional code providing storage of the storage information, the step of creating laser marking information for forming the 2-dimensional code, based on said storage information, wherein the laser marking information includes at least dot coordinate information and the step of laser marking said 2-dimensional code, by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m matrix array inside the unit cell based on the dot coordinate information of said laser-marking information by irradiating a laser beam directly on a material to be marked, wherein the dots are beam spots generated by irradiating a laser beam.

Similarly, amended claim 7 requires an information-acquisition means for acquiring the code size of a 2-dimensional code and storage information that is to be written in the 2-dimensional code, a calculation means for calculating cell size of a unit cell, based upon the acquired code size and the acquired storage information, in order to provide storage of the storage information in the 2-dimensional code, and further creating laser-marking information that includes at least dot coordinate information for forming said 2-dimensional code having the acquired code size, based at least upon said storage information, and a laser marking means for laser marking the 2-dimensional code by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m matrix array inside the unit cell based on the dot coordinate information of said laser-marking information by irradiating a laser beam directly onto a material to be marked, wherein the dots are beam spots generated by irradiating a laser beam, and wherein the acquired code size is fixed regardless of an amount of storage information to be written in the 2-dimensional code.

Amended claim 10 similarly requires an information-acquisition means for acquiring the code size of a 2-dimensional code, number of unit cells of a 2-

dimensional code, and storage information that is to be written into the 2-dimensional code, a calculation means for calculating cell size based upon code size and number of cells, and a process of creating laser-marking information, that includes at least dot coordinate information, for forming said 2-dimensional code having said acquired code size, based on said code size, said storage information, said cell size, and said dot step size or number of dots, and a laser-marking means for performing laser marking of the 2-dimensional code by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m matrix array inside the unit cell based on the dot coordinate information of said laser-marking information, by irradiating a laser beam directly on the material to be marked, wherein the dots are beam spots generated by irradiating a laser beam, and wherein the acquired code size is fixed regardless of an amount of storage information to be written in the 2-dimensional code.

Accordingly, in each of amended claims 1, 7, and 10, a 2-dimensional code having a fixed predetermined code size, regardless of an amount of storage information to be written therein, is formed by calculating a cell size based upon the fixed code size and the amount of storage information or number of cells. Thus, it is possible to form a 2-dimensional code having a desired code size regardless of the amount of information to be stored, and thus, it is possible to attach the desired information as a 2-dimensional code in a very small area.

In other words, once an appropriate code size is selected, and the code size fixed, the code size does not increase with an increase in the amount of information to be stored. Instead, in each of the embodiments of claims 1, 7, and 10, the cell size of the unit cell is calculated to accommodate the amount of storage information within the fixed code size.

Additionally, in each of amended claims 1, 7, and 10, the laser marking information includes at least dot coordinate information, and the code is marked on an object by laser dot marking to uniformly arrange dots vertically and horizontally in an n x m matrix inside the unit cell using the dot coordinate information of the laser marking information, and the dots are beam spots generated by irradiating a laser.

In contrast to each of the above embodiments recited in amended claims 1, 7, and 10, the *Natsukari* publication fails to disclose at least specifying or acquiring a fixed code size, regardless of an amount of storage information to be written therein, specifying or acquiring storage information to be stored in the fixed 2-dimensional code, calculating cell size of a unit cell, based at least upon the specified or acquired fixed 2-dimensional code and the storage information, or creating laser marking information including at lest dot coordinate information for forming the 2-dimensional code, based on the code size and the storage information, and laser marking the 2-dimensional code to uniformly arrange dots vertically and horizontally in an n x m matrix inside a unit cell based on the dot coordinate information of said laser-marking information by irradiating a laser beam directly on a material to be marked, wherein the dots are beam spots generated by irradiating a laser beam.

Further, the *Natsukari* publication discloses that the theoretical symbol size (or code size) changes as the volume of information changes, in contrast to amended claims 1, 7, and 10, in which once the fixed code size has been set, the code size does not increase with an increase in the amount of storage information to be written therein. Thus, as discussed below, in the disclosure of the *Natsukari* publication codes that cannot be created in a defined space are encountered.

The *Natsukari* publication discloses a 2-dimensional code reader setting method, a 2-dimensional code reader, and a 2-dimensional code reader setting program (title; paragraphs [0002] and [0009]). The main objects of the code reader setting program described in the *Natsukari* publication are to allow a user to input specification details of a theoretical 2-dimensional code, for which the code reader setting program will calculate whether such specification details of a theoretical 2-dimensional code is possible, in order to further calculate an attachment specification for the code reader (paragraphs [0010]-[0021], [0025], [0027], [0085], [0140]-[0164], and in particular paragraphs [0102]-[0104], [0108], [0113]). In certain instances, the code specifications would not allow the creation of a 2-dimensional code in a given space, in a given manner, for a given volume of information (paragraphs [0102]-[0104], [0108], [0113]).

In particular, the *Natsukari* publication discloses that when the number of dots to be allocated to one cell is increased, the size of the 2-dimensional code symbol is also increased. This is in contrast to the embodiments of amended claims 1, 7, and 10, which require the fixed code size to remain the same, regardless of the amount of information to be written therein, which in turn makes it possible to attach desired information as a 2-dimensional code in a very small area.

Additionally, since the 2-dimensional code size of the *Natsukari* publication increases with an increase in the amount of storage information, the *Natsukari* publication fails to disclose calculating the cell size of a unit cell, based at least upon the specified or acquired fixed 2-dimensional code size and the storage information. In other words, since the *Natsukari* publication fails to disclose a fixed code size, it follows that the *Natsukari* publication fails to disclose calculating the cell size of a unit cell, based at least upon the specified or acquired fixed 2-dimensional code size.

Further, while the printing of 2-dimensional codes is discussed in general in the *Natsukari* publication in relation to a theoretical 2-dimensional code (which may or may not be possible to create) having certain characteristics such as a code size, a cell size, a printable space, data type, and data volume, there is no discussion in the *Natsukari* publication of setting or acquiring actual storage information to be stored in a 2-dimensional code.

Furthermore, the entire thrust of the program described in the *Natsukari* publication is towards calculating an attachment specification for a code reader. There is no disclosure in the *Natsukari* publication of actually laser marking a 2-dimensional code, let alone creating laser-marking information including at least dot coordinate information and laser-marking a 2-dimensional code based upon the dot coordinate information of the laser-marking information. Instead, as discussed above, code specifications are calculated or input for theoretical or possible 2-dimensional codes that could be created using printers having certain DPI ranges and defined printable areas (paragraph [0103]). While there is an option to describe the possible printing patterns, which printing patterns may be achieved through laser marking or direct marking (paragraph [0098]), there is no discussion of providing or acquiring

information to actually be stored in a 2-dimensional code, and further, no discussion of utilizing the code specifications to create laser-marking information in order to actually laser-mark a 2-dimensional code.

Since there is no discussion of providing or acquiring information to actually be stored in a 2-dimensional code, and further no discussion of utilizing the code specifications to actually laser-mark a 2-dimensional code, it further follows that the *Natsukari* publication fails to disclose creating laser-marking information based upon storage information, and further laser marking a 2-dimensional code based upon the dot coordinate information of the laser-marking information, as is required by all of amended claims 1, 7, and 10.

Further still, the *Natsukari* publication fails to disclose uniformly arranging dots vertically and horizontally in an n x m matrix inside a unit cell using the dot coordinate information of the laser marking information and that the dots are beam spots generated by irradiating a laser.

The Office action acknowledges on page 3 that the *Natsukari* publication fails to disclose a fixed code size for 2-dimensional code regardless of an amount of storage information to be written in the code.

The Office action then turns to the *Namizuka* publication and asserts that the *Namizuka* publication teaches changing pixel density with respect to a fixed size of a code.

Turning to the *Namizuka* publication, however, it is respectfully submitted that the *Namizuka* publication fails to provide for the deficiencies of the *Natsukari* publication discussed above.

In particular, the *Namizuka* publication merely discloses processing images for scanning, printing, copying, or faxing (paragraphs [0007], [0008], [0068]) for example forming a reproduction image on transfer paper (paragraph [0072]).

Thus, the *Namizuka* publication fails to disclose utilizing code specifications to create laser-marking information in order to actually laser-mark a 2-dimensional code directly on a material to be marked.

The *Namizuka* publication also fails to disclose creating laser-marking information based upon storage information, and further laser marking a 2-dimensional code based upon the dot coordinate information of the laser-marking information, as is required by all of amended claims 1, 7, and 10.

Further still, the *Namizuka* publication fails to disclose uniformly arranging dots vertically and horizontally in an n x m matrix inside a unit cell using the dot coordinate information of the laser marking information and that the dots are beam spots generated by irradiating a laser.

Even further still, the *Namizuka* publication fails to disclose at least specifying or acquiring a fixed code size, regardless of an amount of storage information to be written therein, specifying or acquiring storage information to be stored in the fixed 2-dimensional code, calculating cell size of a unit cell, based at least upon the specified or acquired fixed 2-dimensional code and the storage information, or creating laser marking information including at lest dot coordinate information for forming the 2-dimensional code, based on the code size and the storage information, and laser marking the 2-dimensional code to uniformly arrange dots vertically and horizontally in an n x m matrix inside a unit cell based on the dot coordinate information of said laser-marking information by irradiating a laser beam directly on a material to be marked, wherein the dots are beam spots generated by irradiating a laser beam, as required by amended claims 1, 7, and 10.

As previously mentioned, the *Namizuka* publication discloses processing images for scanning, printing, copying, or faxing (paragraphs [0007], [0008], [0068]). In particular, the *Namizuka* publication discloses outputting a visible image based upon a processed output image signal so that a pixel density of the output image signal is higher than a pixel density of the digital image (abstract).

The *Namizuka* publication simply discloses converting data of a size N pixel x N pixel, via bitmap conversion, to high definition density of 2N pixels x 2N pixels (Figs. 12A, 12B; paragraphs [0109], [0113]). In other words, the *Namizuka* publication simply discloses doubling the pixel density. A smoothing process can also be carried out after the conversion (Fig. 12C; paragraphs [0109], [0113])

This doubling of pixel density can in no way be considered to be the same as specifying or acquiring a fixed code size, regardless of an amount of storage information to be written therein, as is required by amended claims 1, 7, and 10.

Yet further still, the *Namizuka* publication deals with pixels, which, by definition are the smallest item of information in an image. This is in contrast to amended claims 1, 7, and 10, which require dots that are beam spots formed by irradiating a laser directly onto a material to be marked, the dots being uniformly arranged in an n x m matrix inside a unit cell, which is effectively the smallest item of information.

Thus, it can be seen from the above discussion that the *Namizuka* publication fails to provide for the deficiencies of the *Natsukari* publication, and thus, the proposed combination of the *Natsukari* and *Namizuka* publications fails to disclose every step or feature of amended claims 1, 7, and 10. Therefore, a *prima facie* case of obviousness cannot be maintained with respect to amended claims 1, 7, and 10, and withdrawal of this rejection is respectfully requested.

As mentioned above, applicants submit that independent claims 1, 7, and 10 are patentable and therefore, claims 2, 3, 8, 9, 11, and 12 which respectively depend from claims 1, 7, and 10, are also considered to be patentable as containing all of the elements of respective claims 1, 7, and 10, as well as for their respective recited features.

3. Rejection of claims 4, 6, and 13 under 35 U.S.C. § 103(a) as being unpatentable over U.S. publication no. 2004/0046024 (*Natsukari et al.*) as modified by U.S. publication no. 2006/0098227 (*Namizuka et al.*), in further view of U.S. publication no. 2004/0094729 (*Struye et al.*)

Reconsideration of this rejection is respectfully requested on the basis that the rejection fails to establish a *prima facie* case of obviousness with respect to claims 4 and 13, since the proposed combination of the *Natsukari*, *Namizuka*, and *Struye* publications fails to disclose each and every recited step or element of amended claims 4 and 13. The remaining claim 6 depends from claim 4, and is therefore

patentable as containing all of the recited steps of claim 4, as well as for its respective recited steps.

By way of review, amended claims 4 and 13 require acquiring manufacturing history of a part or a plurality of parts, converting data including an ID number for identifying manufacturing-history information or manufacturing-history information itself for a part into a 2-dimensional code, setting a fixed size of the 2-dimensional code in a parameter setting step or according to the part/parts, regardless of an amount of storage information to be written therein, as well as forming a 2-dimensional matrix data having 1 bit per cell, combining the 2-dimensional matrix data with the fixed size of the 2-dimesional code and converting the combined information into data for laser marking including beam spot coordinates, and laser marking the 2-dimensional code having the set size directly on the part/parts, and arranging dots uniformly vertically and horizontally in an n x m matrix array inside a unit cell based on the beam spot coordinates, where the dots are beam spots generated by irradiating a laser beam.

The deficiencies of the *Natsukari* and *Namizuka* publications are discussed above in detail. It is respectfully submitted that the *Struye* publication fails to provide for the deficiencies of the *Natsukari* and *Namizuka* publications discussed above.

By way of reiteration, both the *Natsukari* and *Namizuka* publications fail to disclose laser marking a 2-dimensional code onto a part. Further, as discussed above in relation to storage information, the *Natsukari* publication fails to disclose acquiring manufacturing-history information for a part. The *Namizuka* publication also fails to disclose acquiring manufacturing-history information for a part.

Since both the *Natsukari* and *Namizuka* publications fail to disclose acquiring such information, the *Natsukari* and *Namizuka* publications also fails to disclose converting data including an ID number for identifying manufacturing-history information or manufacturing-history information itself for a part into a 2-dimensional code and setting a fixed size of the 2-dimensional code in a parameter setting step or according to the part/parts, regardless of an amount of storage information to be written therein, as well as forming a 2-dimensional matrix data having 1 bit per cell,

combining the 2-dimensional matrix data with the fixed size of the 2-dimesional code and converting the combined information into data for laser marking including beam spot coordinates, and laser marking the 2-dimensional code having the set size directly on the part/parts.

While the *Struye* publication does disclose marking an item with manufacturing time (paragraph [0080]) there is simply no disclosure in the *Struye* publication of converting data including an ID number for identifying manufacturing-history information or manufacturing-history information itself for a part into a 2-dimensional code and setting a fixed size of the 2-dimensional code in a parameter setting step or according to the part/parts, regardless of an amount of storage information to be written therein, as well as forming a 2-dimensional matrix data having 1 bit per cell, combining the 2-dimensional matrix data with the fixed size of the 2-dimesional code and converting the combined information into data for laser marking including beam spot coordinates, and laser marking the 2-dimensional code having the set size directly on the part/parts.

Thus, neither the *Natsukari*, *Namizuka* nor the *Struye* publications disclose converting data including an ID number for identifying manufacturing-history information or manufacturing-history information itself for a part into a 2-dimensional code and setting a fixed size of the 2-dimensional code in a parameter setting step or according to the part/parts, regardless of an amount of storage information to be written therein, as well as forming a 2-dimensional matrix data having 1 bit per cell, combining the 2-dimensional matrix data with the fixed size of the 2-dimesional code and converting the combined information into data for laser marking including beam spot coordinates, and laser marking the 2-dimensional code having the set size directly on the part/parts, as is required by amended claims 4 and 13.

Accordingly, the proposed combination of the *Natsukari*, *Namizuka*, and *Struye* publications fails to disclose converting data including an ID number for identifying manufacturing-history information or manufacturing-history information itself for a part into a 2-dimensional code and setting a fixed size of the 2-dimensional code in a parameter setting step or according to the part/parts, regardless of an amount

of storage information to be written therein, as well as forming a 2-dimensional matrix data having 1 bit per cell, combining the 2-dimensional matrix data with the fixed size of the 2-dimesional code and converting the combined information into data for laser marking including beam spot coordinates, and laser marking the 2-dimensional code having the set size directly on the part/parts, as is required by amended claims 4 and 13.

Thus, since the proposed combination of the *Natsukari*, *Namizuka*, and *Struye* publications fails to disclose every step or feature of amended claims 4 and 13, a *prima facie* case of obviousness cannot be maintained with respect to amended claims 4 and 13, and withdrawal of this rejection is respectfully requested.

Further, since the *Natsukari* publication is directed solely to a 2-dimensional code reader and a 2-dimensional code reader program and the *Namizuka* publication merely describes an image processing apparatus, a skilled artisan would not have thought to combine the teachings of marking an item, as described in the *Struye* publication, with the reader of the *Natsukari* publication or the image processing apparatus of the *Namizuka* publication.

Accordingly, for the reasons discussed above, a *prima facie* case of obviousness cannot be established with respect to amended claims 4 and 13, and withdrawal of this rejection is respectfully requested.

As mentioned above, applicants submit that independent claim 4 is patentable and therefore, claim 6, which depends from claim 4, is also considered to be patentable as containing all of the steps of claim 4, as well as for its respective recited steps.

4. Rejection of claim 5 under 35 U.S.C. § 103(a) as being unpatentable over U.S. publication no. 2004/0046024 (*Natsukari et al.*) as modified by U.S. publication no. 2006/0098227 (*Namizuka et al.*) and U.S. publication no. 2004/0094729 (*Struye et al.*) as applied to claim 4, and further in view of U.S. publication no. 2003/0224256 (*Endo et al.*)

This rejection is rendered moot by the cancellation of claim 5.

Accordingly, withdrawal of this rejection is respectfully requested.

5. Conclusion

As a result of the amendment to the claims, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that every pending claim in the present application be allowed and the application be passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicants' attorney, the examiner is invited to contact the undersigned at the numbers shown below.

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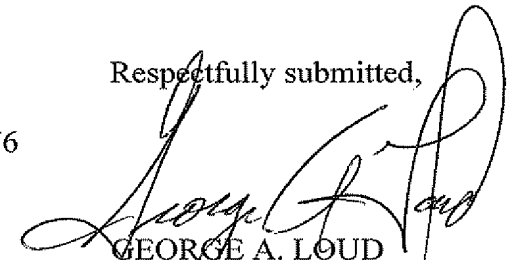
Respectfully submitted,



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